APPLICATION

FOR

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TITLE: METHOD AND SYSTEM FOR PROVIDING A FILTER FOR A ROUTER

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METHOD AND SYSTEM FOR PROVIDING A FILTER FOR A ROUTER

Background Of The Invention

Field of the Invention

This invention generally relates to routers, and more specifically, to procedures for providing routers with filters.

Prior Art

Routers are used to direct data among and between subnetworks or devices of a network. Since a network can include tens of thousands of individually addressable devices, the operation of a router can be quite complex.

In order to perform their complex operations, routers may be provided with filters, which are sets of rules that determine how the routers transmit data. For instance, when a router receives data, a filter may be used to determine the type or class of the data, or a filter may be employed to determine when, where and how to send the data.

Occasionally, after a network has been designed and implemented and is in use, a filter may be written specifically for the network in order to address circumstances or situations comparatively specific to that network. Although the people writing such specific filters may be very knowledgeable about certain aspects of the operation and needs of the network, these people often have very limited expertise or experience in writing filters. Because of this, these specifically written filters may not be very effective, or may actually have adverse unintended consequences.

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Summary Of The Invention

An object of this invention is to improve procedures for providing filters for routers.

5   Another object of the present invention is to provide a router with a better, substitute filter for a filter specifically written for the router.

These and other objectives are attained with a method and system for providing a filter file for a router. A set of pre-written standardized filters are provided, and a program is
10   run on a computer to identify one of these pre-written filters as a substitute for a non-standard filter that was written specifically for the router. That identified substitute filter is loaded onto the router and used instead of the filter that had been specifically written for the router. Preferably, the computer program is used to identify which one of the pre-written standardized filters most closely matches, according to a predefined test, the
15   filter written specifically for the router.

Further benefits and advantages of the invention will become apparent from a consideration of the following detailed description, given with reference to the accompanying drawings, which specify and show preferred embodiments of the
20   invention.

Brief Description Of The Drawings

Figure 1 shows a network having a router and a group of subnetworks.

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Figure 2 is a flow chart illustrating a preferred implementation of this invention.

Figure 3 show a computer system that may be used in the practice of the invention.

Figure 4 illustrates a memory medium that can be used to hold a computer program for carrying out this invention.

Detailed Description Of The Preferred Embodiments

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Fig. 1 shows a network 10 which, for illustrative purposes, includes a first, second and third subnetworks (hereinafter referred to as subnets) S1, S2 and S3. The subnets S1, S2 and S3 can have the same topologies or they can have different topologies. The topologies include, but are not limited to, Token ring, Ethernet, X.25 and FDDI.

10 Devices 12, 13, 14, 15, 16 and 18 are connected to the first subnet S1; devices 20, 22, 23, 24, 25, 26 and 28 are connected to the second subnet S2; and devices 30, 32, 33, 34, 35, 36, and 37 are connected to the third subnet S3. A router 38 interconnects the first, second and third subnets S1, S2 and S3.

15 The devices or hosts 12-37 can be workstations, personal computers, hubs, printers, network adapters, multiplexers, etc. It should be noted that for the purposes of this document, the terms "hosts" and "devices" are used interchangeably. The network 10 is scalable, which allows computing resources to be added as needed. Although only a small number of devices 12-38 are shown, the network 10 can encompass many

20 addressable devices, for instance, up to tens of thousands of addressable devices.

Each device 12-38 has a physical address and a unique Internet protocol (IP) address. For example, TCP/IP may be used as the protocols that regulate how data are packeted into IP packets and transported between the devices 12-38. Network 10 may also

25 include a network manager 40 that is connected to the first subnet S1, and any suitable management protocol may be used in the operation of the network.

Router 38 is provided with one or more filters to help secure data around the network. Each filter is a set of rules that determine how the router will transmit data. As

30 mentioned above, a filter will be written after a network is implemented in order to

address specific circumstances of the network operation. Often, these specific filters are written by individuals who are not experts at writing filters. As a result, although the intended purposes of the filters may be highly desirable, the filters themselves may not be effective or may have adverse unintended consequences.

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Generally, in accordance with the present invention, a set of pre-written filter are provided, and a program is run on a computer to identify one of these pre-written filters as a substitute for the filter that was written specifically for the router. That identified substitute filter is loaded onto the router, and used instead of the filter that had been

10 specifically written for the router. Preferably, the computer program is used to identify which one of the pre-written filters of the pre-written filter files most closely matches, according to a predefined test, the filter written specifically for the router.

Figure 2 illustrates a preferred routine 50 for identifying one or more substitute filters for

15 specifically written filter or filters. In this routine, step 52 represents providing a router filter file written specifically for the router, and step 54 represents providing a set of pre-written router filters in a file. Step 56 represents running the computer program.

At steps 60 and 62, data structures are created for the pre-written filter and for the

20 specifically written filters. As represented by step 64, the specifically written filters are matched with the pre-written filters. When a match for a specifically written filter is found, the routine, as represented by step 66, creates a data structures for the matched pre-written filter; and when no match is found for a specifically written filter, the routine, as represented by step 70, creates a data structure entry with the specific filter.

25 Steps 64, 66 and 70 are repeated until searches have been performed to find matches ro all the specifically written filters. Then, at step 72, a new specific filter file is written, and at step 74, the pre-written filter file and the new specific filter file are loaded onto the router.

Any suitable set of pre-written filters may be used in the practice of this invention. For example, standard commercially available filters may be used, or non-standard filters may be used.

5   Likewise, any suitable criteria and procedures may be employed to identify the appropriate substitute filter for the specifically written filter. These criteria and procedures may be identified in advance, or may be determined at the time the program is run to identify the substitute filter. Also, the criteria and procedures may be provided by the individuals or entities who provide the pre-written filters, or by the individuals or

10   entity who wrote the specifically written filter.

As will be understood by those skilled in the art, any suitable computing or calculating system or apparatus may be used to practice this invention. For example, a suitable computer system illustrated at 80 in Figure 3 may be used. System 80, generally,

15   comprises a series of CPUs, a cache subsystem 84, and a random access memory (RAM) 86. Also, as will be understood by those skilled in the art, the present invention may be embodied in a computer program storage device (including software embodied in a magnetic, electrical, optical or other storage device). One suitable storage medium is illustrated, for example, at 90 in Figure 4.

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While it is apparent that the invention herein disclosed is well calculated to fulfill the objects stated above, it will be appreciated that numerous modifications and embodiments may be devised by those skilled in the art, and it is intended that the appended claims cover all such modifications and embodiments as fall within the true

25   spirit and scope of the present invention.